mitting to memory. It is in no sense an elocutionist's manual, the editors having made the first test of each selection, "Is it worth learning?" and the second, "Is it adapted to recitation?" The book is representative of English literature, and also comprises many translations from foreign sources. Its various departments contain many of the familiar classics, and also many extracts from late literature never before included in such a collection. It is arranged in three volumes, each complete in itself, and specially adapted to the age for which it is intended. Volume I. is designed for children from four to ten years old; Volume II., for those from ten to fourteen; and Volume III., for the oldest students. The purpose of the book is to train the memory, to educate the literary taste, and to supply the student with the long-needed standard collection of poetry and prose for recitation.

— "The Batrachia of North America," by E. D. Cope, issued as Bulletin No. 34 of the National Museum, embraces the results of a study of the characters of the species, with their variations, which has been rendered effective by the full collection contained in the National Museum, and which this work thus illustrates. Besides this descriptive part, there are presented the results of a thorough study of the osteology of the class, based on the material contained in various museums of the United States and Europe. These results are expressed largely in systematic form, in the belief that descriptive zoölogy will never be complete until the structure is exhausted in furnishing definitions. Wherever practicable, reference is made to the relations between the extinct and living forms.

LETTERS TO THE EDITOR.

The Telephone for the Prediction of Thunder-Storms.

IN 1886 the writer had an experimental telephone line on the Yale campus which proved to be of some value in the prediction of one phase of the weather. As is well known, the approach of an electrical storm produces sounds in the telephone something like the "sound of a distant rocket, or the quenching of a drop of melted metal in water."

One afternoon shortly after the erection of my line, on a seemingly perfectly clear day, I heard the sounds in the telephone. Although at the time there was no sign of an approaching storm, two hours later the clear weather had vanished, and a severe storm swept over the city.

On another occasion, when an excursion had been planned, as the weather was cloudy and rather doubtful, the telephone was consulted, but gave no evidence of electrical disturbance; and the afternoon passed "fair weather."

In several like instances I made use of the instrument with very satisfactory results. Since then I have had no opportunity for continuing my observations, but I think that similar use of the telephone might be of value to individuals or to local communities.

HARVEY B. BASHORE.

West Fairview, Penn., Oct. 14.

Map of Niagara Falls.

ON the 88th sheet of the new "Stieler's Hand Atlas," No. 6 of the United States, is a small map of Niagara Falls, which contains a curious misprint. The course of the river is well shown, colored red on the Canadian and green on the United States side. The horseshoe fall is represented, but the American fall is obliterated. The coloration for the bank extends all round Goat Island; which, however, instead of being an island, is a peninsula. In other words, there is no American fall represented on the map except in name.

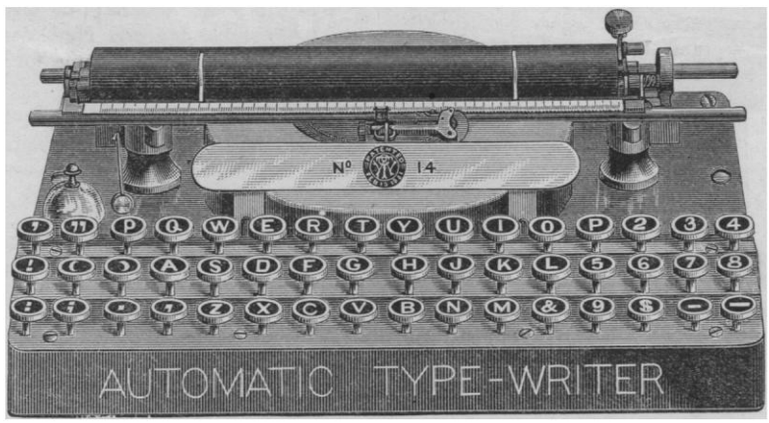
JOSEPH F. JAMES.

Washington, D.C., Oct. 10.

INDUSTRIAL NOTES.

The Automatic Type-Writer.

ALL are familiar with the ordinary styles of type-writer on the market, and some have asked if there could not be made a type-writer which should cost less and be more portable by being smaller in size and weight. Several attempts have been made to meet this want, and this week we have an opportunity of describing the "Automatic," which it is claimed serves the purpose well.



In size the "Automatic" is 11½ inches long, 8¼ wide, and 4 high. Its weight is 10 pounds, and with its case, only 12¾.

The key-board of 48 keys has been designed with a view to furnishing all the characters in common use. The type and type-bars are so arranged that the type is inked by spring contact with an ink-pad against which it rests when in repose, and the type-bars are so guided in their motion as to give very accurate alignment. No ribbon intervenes between the type and paper, the impression being thus the clearer. It is claimed for the "Automatic," that, as the paper-carriage is light, as the space through which the type must move is small, and as its return motion is accelerated by a spring, the speed of writing is much increased.

By an ingenious device the spacing is made to suit the letter. Thus, *I* occupies less space than *H*, and *H* less again than *M*.

There are other interesting features to the machine, but we have said enough to show that those interested should examine the merits of the "Automatic."

The Offrell Dynamo.

ALTHOUGH the construction of dynamos and motors has reached such a state of perfection, as regards efficiency and workmanship, that any improvement in this direction is not likely to be made, yet many of the electric machines in the market to day are far from being samples of either of the above qualities; and, to be sure, if we consider them from the point of simplicity and economical construction, there is a big margin for improvement.

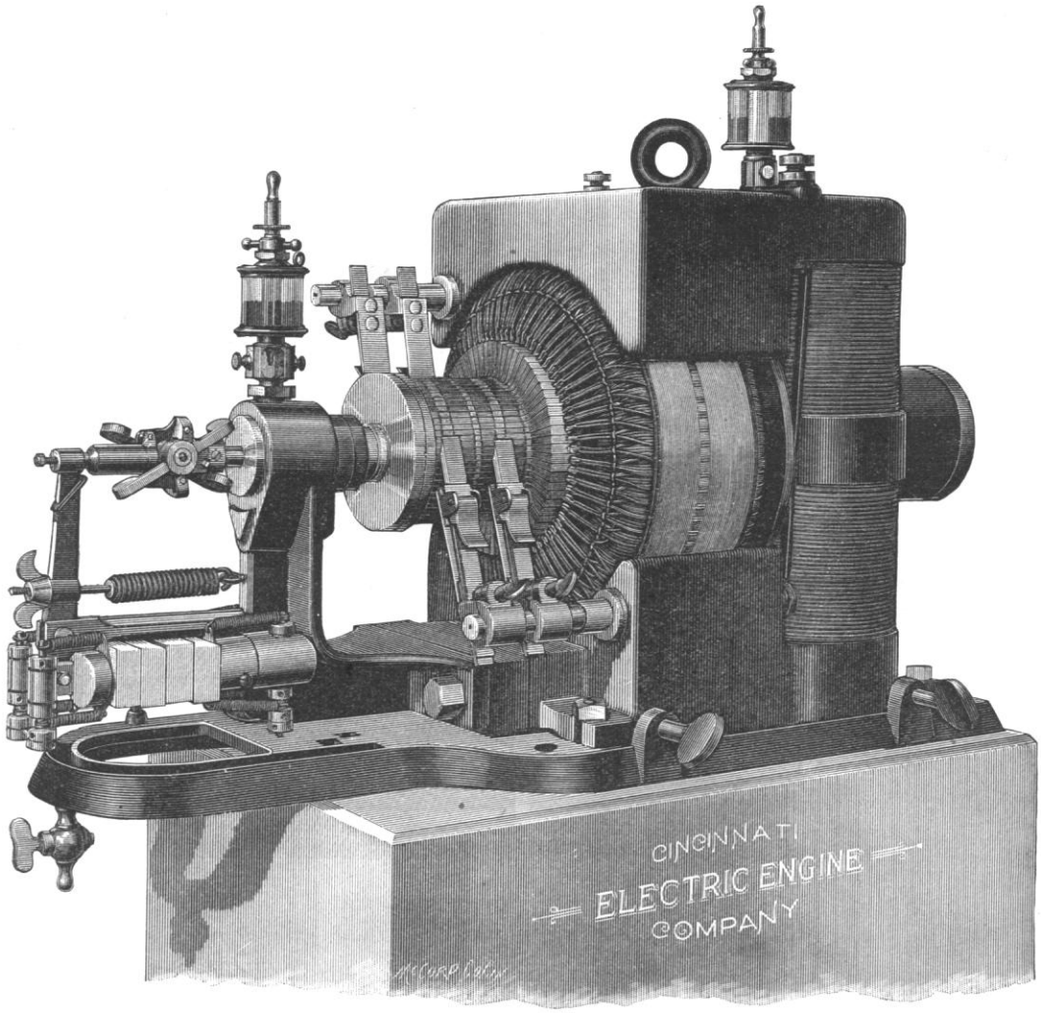
Setting out with the object in view of designing a dynamo, that, with minimum expenditure of material, should give maximum output, and at the same time the cost of its manufacture be a minimum, Mr. Olof Offrell, electrical engineer, has designed and built such a dynamo.

To gain this purpose, only the very best material is used; also advantage is taken of the latest development in dynamo-building. The field-magnet cores are of the very best wrought iron, the pole-

pieces being the softest possible cast iron. The magnets and the pole-pieces form a solid frame, being held together by nuts on the tapped ends of the magnets. The armature, which is of the Gramme type, is supported by brackets of brass bolted to the pole-pieces, and the shaft runs in phosphor-bronze bearings fitted to the brackets. The armature is made of annealed wrought-iron wire supported by a three-armed spider of brass.

The brush arrangement is of improved construction, original with the designer, and enables the tension of the brushes to be adjusted without disturbing the setting of the same, and without exposing the attendant to shocks from the machine. This is effected by an insulated thumb-screw, — aside from the thumb-screw that holds the brushes, — which clamps the brush-holders to the brush-pin. The rocker-arm is also movable. The cables from the brushes are carried to a board on top of the machine, on which are two horse-power, and, being very compact, occupies a floor-space of only ten by nineteen inches, with a height of twelve inches.

The armature is of the Gramme ring type, and the pulley end of the shaft has its bearing in the neutral part of the field-magnet. The shaft is of English tool steel of the best quality, the bearings are ground true on dead centres, and the armature is so attached as to practically constitute a portion of it, avoiding all danger of loosening, — a point of importance in this class of machinery. Ball bearings are used, admitting of self-alignment. They are made of phosphor-bronze, hand-reamed, and of considerable length, to give an even bearing surface and prevent all tendency to heat. The commutator sections are of drop-forged copper, hard, and of almost pure metal. The commutator is attached to the armature in a novel manner, and can be renewed without disturbing the armature wires.



CINCINNATI ELECTRIC ENGINE COMPANY'S MOTOR.

placed the terminals; also a switch for short-circuiting the field-coils, in case it is desired to "paralyze" the machine while running. Thus the switch and terminals are always in sight, and can be attended to at once, if necessary.

A remarkable feature of this dynamo is that it requires exceedingly small floor-space for its capacity, — a feature of great value when the space is limited, as on board of ships, etc. The floor-space required for a twelve-light dynamo is only twenty-four by twenty-four inches.

A New Constant-Current Electric Motor.

THE electric motor shown in the accompanying illustration is one of a series manufactured and placed on the market by the Electric Engine Company of Cincinnati. It is intended to run on a constant-current or arc-light circuit, has a maximum capacity of

The armature is accurately adjusted to a running balance, and provided with means for forced ventilation. The ordinary rocker-arm supporting the brush-holder has been dispensed with, thus rendering the important parts more readily accessible.

The governor, the construction of which is shown in the figure, maintains the speed constant under all variations of load from zero to the full designed load of the machine, and is remarkably simple, having but one wearing point. It regulates solely by variation of pressure, practically eliminating motion and wear: hence it has great durability and sensitiveness.

For constant potential circuits, this company manufactures motors of similar design, but differing in detail. As they regulate automatically, they do not require governors. These are made for standard potentials of 110, 220, and 550 volts, though they may be made for any specified voltage.